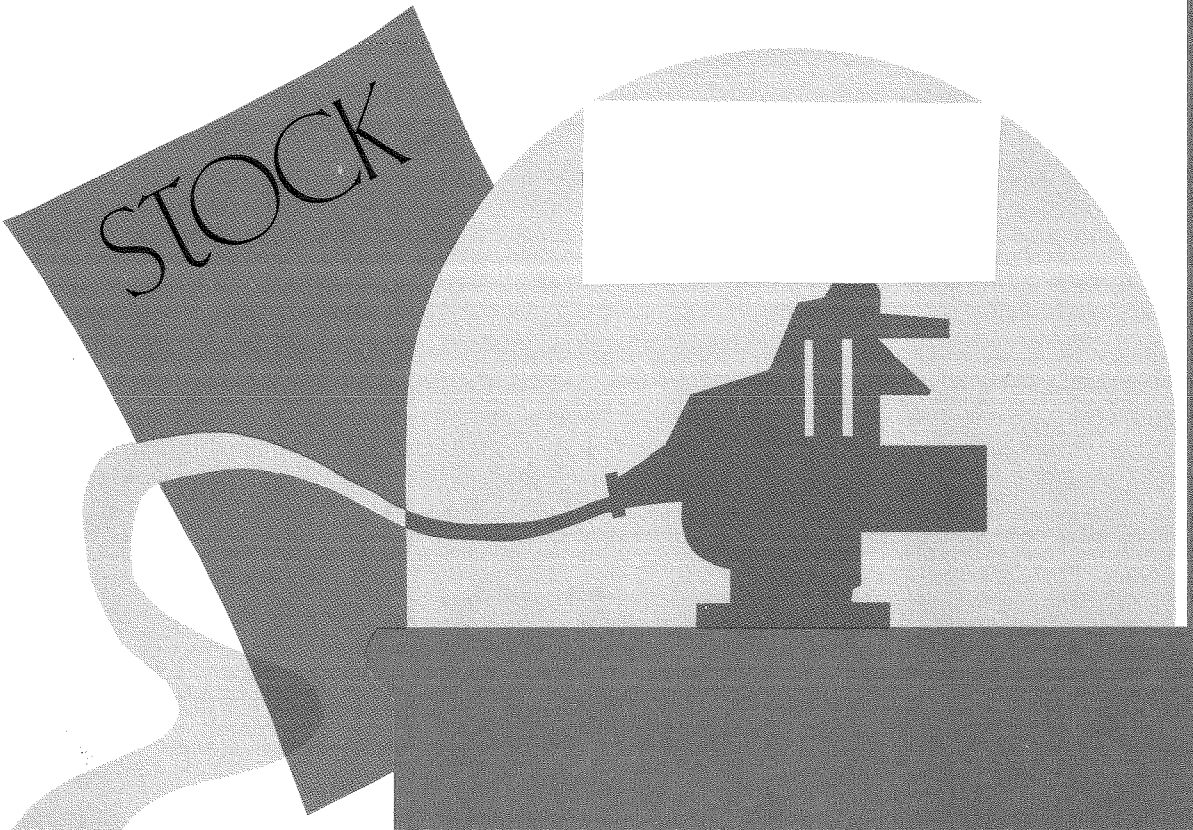
FEDERAL RESERVE BANK OF SAN FRANCISCO

ECONOMIC REVIEW



INFORMATION AND MARKET EFFICIENCY

SPRING 1978

Information and Market Efficiency

Markets provide consumers and producers with information—the prices at which they can buy and sell—which they need to make rational economic decisions. Economists judge market performance both by the reliability of the information conveyed and by the efficiency with which market participants utilize that information. The four articles in this issue examine questions of the quality of information and the efficiency of its use in various specific markets — Treasury bills, GNMA futures, commodity markets and the stock market.

William Poole applies such an analysis to the market for Treasury-bill futures which began trading in early 1976. The evidence suggests that the T-bill futures market is closely linked to the spot market in bills, at least for the nearest futures maturity. Unexploited arbitrage opportunities between the two markets rarely exist.

In Poole's view, the existence of the explicit interest-rate forecasts provided by the futures market emphasizes the need for policymakers to understand why discrepancies arise between market forecasts and their own interest-rate forecasts. "If, at some point in time, rates in the bill futures market are based on forecasts of a strong and/or more inflationary economy than projected by policymakers, and if the market is correct, then there is a danger that policymakers will determine a more expansionary policy than is appropriate for the needs of the economy."

Market interest-rate forecasts also may reflect forecasts of policies that are different from those that policymakers are actually planning. Consequently, policymakers should make their plans known and ensure that announced policy plans are realized. However, this raises the question of how adjustments may be made in response to changing economic conditions. Poole sees no easy solution to this dilemma, except perhaps by including in the concept of a policy plan an understanding of the policy adjustments required by certain contingencies.

Poole notes that today's futures rate is not an especially accurate forecast of "tomorrow's" spot rate, so that its policy significance ought not to be exaggerated. However, policymakers' own forecasts of interest rates are not very accurate either. "Unless policymakers have solid evidence that their own forecasts are more accurate than market forecasts, they cannot afford to ignore the T-bill futures market."

Kenneth Froewiss analyzes another new type of market — the futures market in the financial instruments of the Government National Mortgage Association (GNMA). This market was inaugurated in late 1975 by the Chicago Board of Trade, but it is the result of several earlier developments dating back to the late 1960's. The first was the mortgage industry's attempt to devise a hedging mechanism to protect itself from unforeseen interest-rate fluctuations. The second was GNMA's introduction of a new security — the pass-through certificate — to attract more investors to the housing market.

Froewiss' empirical results suggest that the GNMA spot market has improved its performance in the period since futures trading began in those securities. "The spot market has become more efficient in processing new information; it has shown less purely random price variability; and it has become more closely integrated with the rest of the bond market." Futures trading is not necessarily responsible for any of those beneficial developments, but it clearly has not had a destabilizing effect on spot-market prices of GNMA certificates.

Froewiss argues that these conclusions have a wider reference than to the GNMA market alone. Financial futures markets are still in their

infancy, so that more and more of them are likely to be established. "The results of this study of GNMA futures suggest that we have nothing to fear and potentially much to gain from the further development of these markets."

Michael Gorham, in a third paper, discusses the development of information in commodity markets. Most market participants rely upon some source or sources of information to enhance their decision-making abilities, obtaining this information from both the public and private sectors. Gorham explores the relationship between public- and private-market information, with particular emphasis on a specific market with a large component of public-sector information — the market for agricultural commodities.

Gorham shows how public information both destroys and creates opportunities for providers of private-sector information. He then measures the private sector's response to these new opportunities in the case of three major agricultural commodities with highly-developed spot and futures markets. His analysis indicates that private-information sources correctly forecast public-sector announcements for soybeans, but not for corn and wheat.

For technical reasons, the quality of both types of information generally improves during each individual crop year. However, over longer periods, public-sector information has improved in quality, whereas the private sector's forecasting ability has lagged behind. Gorham does not find this surprising. "The public sector, unlike the private sector, is not constrained by considerations of profitability when adopting improved methods of forecasting or expanding its survey activities — although of course it is subject to certain budget constraints." The U.S. Department of Agriculture thus has been better situated than the private sector to improve its forecasting ability.

Kurt Dew, in a final paper, considers the information provided by the stock market as a means of analyzing changes in monetary-policy behavior. He poses the question — "Are changes in policy procedures only differences in style or does monetary policy now affect the economy in a substantially different way than it did in the 1960's?" Utilizing the theory of efficient markets, he answers by saying that the Federal Reserve's response to money growth *has* changed, and as a result, the economic impact of a temporary deviation of money growth from trend has actually been reversed.

Dew makes the case that the Fed today raises interest rates in response to undesirably rapid money growth, whereas it did not do so in the 1960's. This change in response is revealed indirectly, through an analysis of the stock market's response to the money supply. He points to evidence that the stock market today (unlike the 1960's) responds negatively to an increase in the money supply. He then bolsters his conclusion with the proposition that the stock market is an efficient forecaster of the future economic impact of a change in the money supply, which impact in turn depends on the Federal Reserve's policy reaction.

Dew argues that the new emphasis on the monetary aggregates has in fact altered the structure of the economy, and that most econometric models of the monetary-transmission process are misspecified as a result. He questions the naive interpretation of the portfolio-adjustment theory — namely, that an excess demand or supply of money precedes changes in long-term interest rates and equity values, which changes in turn influence levels of real economic activity. Dew's empirical work instead indicates that stock prices and interest rates primarily reflect anticipated trend rates of money growth. "Thus, according to a more accurate interpretation of portfolio theory, past rates of money growth affect current real economic activity only if they affect forecasts of future money growth."